

FORM PTO-1399 (Modified)
(REV 11-98)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

#09994US2PCT

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

09/869126

INTERNATIONAL APPLICATION NO.

PCT/CH98/00553

INTERNATIONAL FILING DATE

24 DECEMBER 1998

PRIORITY DATE CLAIMED

NONE

TITLE OF INVENTION

COMMUNICATIONS SYSTEM, COMMUNICATIONS METHOD AND SUITABLE DEVICES THEREFOR

APPLICANT(S) FOR DO/EO/US

Rudolf RITTER

JUN 25 2001

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
9. ☒ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☒ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

Request for Consideration of Documents Cited in International Search Report

Notice of Priority

English translation of the Amendments to the Claims Under PCT Article 19 Amended Sheets (Pages 14-23)

English translation of the Annexes to the International Preliminary Examination Report Amended Sheets (Pages 2-5, 5a, 5b and 14-20)

Drawings (1 sheet)

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 1.53) 097869126		INTERNATIONAL APPLICATION NO. PCT/CH98/00553		ATTORNEY'S DOCKET NUMBER 209994US2PCT	
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21. The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO **\$1,000.00**
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **\$860.00**
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **\$710.00**
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) **\$690.00**
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) **\$100.00**

ENTER APPROPRIATE BASIC FEE AMOUNT =

Surcharge of **\$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)). **\$0.00**

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	35 - 20 =	15	x \$18.00	\$270.00
Independent claims	2 - 3 =	0	x \$80.00	\$0.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>				\$0.00
TOTAL OF ABOVE CALCULATIONS =				\$1,130.00

Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable). ☐ **\$0.00**

SUBTOTAL = \$1,130.00

Processing fee of **\$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)). **\$0.00**

TOTAL NATIONAL FEE = \$1,130.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). ☐ **\$0.00**

TOTAL FEES ENCLOSED = \$1,130.00

	Amount to be:	
	refunded	\$
	charged	\$


☒ A check in the amount of **\$1,130.00** to cover the above fees is enclosed.

☐ Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **15-0030** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:



22850

Surinder Sachar
Registration No. 34,423

Surinder Sachar

SIGNATURE _____

Marvin J. Spivak

NAME _____

24,913

REGISTRATION NUMBER _____

6-25-01

DATE _____

09/869126

JCO3 Rec'd PCT/PTC 25 JUN 2001

209994US

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF: :
RUDOLF RITTER : ATTN: APPLICATION DIVISION
SERIAL NO: NEW U.S. PCT APPLN :
(BASED ON PCT/CH98/00553)
FILED: HEREWITH :
FOR: COMMUNICATIONS SYSTEM,
COMMUNICATIONS METHOD AND
SUITABLE DEVICES THEREFOR

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Prior to a first examination on the merits, please amend the above-identified
application as follows:

IN THE CLAIMS

Please amend the claims as follows:

1. (Amended) A communications system, which comprises a multiplicity of mobile devices, to which an identification module is connected in each case, in which identification modules a user identification of the user of the respective mobile device is stored in each case, which communications system comprises at least one visitor location register, to which

visitor location register user identifications of the users are transmitted each by means of one of the mobile devices and are stored there, and which communications system comprises at least one home location register, in which the user identifications are each linked to a call number and to further user data, which user data comprise location information for a respective user, the location information being transmitted from a visitor location register to the home location register of a user, wherein

it comprises connecting modules, by means of which connecting modules one of the mobile devices in each case is connectible by a user to a lower voltage grid, the connecting modules each comprising a connecting plug for connection to the low voltage grid, by means of which connecting plugs the connecting modules are each connectible to the low voltage grid via outlets of the low voltage grid, and the connecting modules comprising an interface module for connection to the respective mobile device, and

the connecting modules each comprise a suitable power line communications module by means of which the respective mobile device is able to communicate via the low voltage grid with other units which are connected to the low voltage grid via a power line communications module.

2. (Amended) The communications system according to claim 1, wherein it comprises at least one visitor location register which is connected to at least one low voltage grid via the power line communications module, and wherein user identifications are transmittable to this power supply network visitor location register via the low voltage grid by respective mobile devices.

3. (Amended) The communications system according to claim 2, wherein the power supply network visitor location register comprises a table in which address data relating to connecting modules are linked to associated user identifications and are stored.

4. (Amended) The communications system according to claim 3, wherein the power supply network visitor location register transmits to the home location register of a user a roaming number relating to the mobile device of this user, and wherein the roaming numbers are additionally linked in the table with associated user identifications and are stored.

5. (Amended) The communications system according to claim 4, wherein at least certain of the roaming numbers comprise address data relating to a connecting module.

6. (Amended) The communications system according to claim 2, wherein at least certain pieces of the location information comprise address data relating to the power supply network visitor location register.

7. (Amended) The communications system according to claim 2, wherein the communications system comprises a connecting network via which the power supply network visitor location register is able to communicate with at least one home location register and/or at least one mobile switching center.

8. (Amended) The communications system according to claim 7, wherein the connecting network comprises a SS7 signalling system, or is the Internet or an intranet.

9. (Amended) The communications system according to claim 7, wherein the power supply network visitor location register is set up in such a way that it is able to communicate, by means of MAP messages, with other network units connected to the connecting network.

10. (Amended) The communications system according to claim 7, wherein the power

supply network visitor location register comprises a gateway module, which gateway module is able to pass on calls from terminals to respective mobile devices, which calls have been passed on via the connecting network to the power supply network visitor location register, and which gateway module is able to pass on calls from respective mobile devices via the connecting network to a respective network unit, in particular a second power supply network visitor location register, for further transmission to a called terminal.

11. (Amended) The communications system according to claim 2, wherein the power supply network visitor location register comprises a gateway module, which gateway module is able to pass on calls from terminals to respective mobile devices, which calls have been received from a mobile switching center and have been passed on to the power supply network visitor location register, and which gateway module is able to pass on to a respective mobile switching center calls from respective mobile devices for further transmission to a called terminal.

12. (Amended) The communications system according to claim 2, wherein the power supply network visitor location register comprises a billing module which is able to record and bill for services that have been carried out for a respective mobile device.

13. (Amended) The communications system according to claim 12, wherein the billing module is able to bill recorded services to a respective mobile device directly via the low voltage grid.

14. (Amended) The communications system according to claim 1, wherein the interface module comprises an interface with contacts, a contactless infrared interface, a contactless inductive interface and/or a contactless high frequency radio interface.

15. (Amended) The communications system according to claim 1, wherein the connecting modules comprise charging modules by means of which energy storage devices for operation of the mobile devices are chargeable on the low voltage grid.

16. (Amended) A communications method in which user identifications of users of a multiplicity of mobile devices are each stored in an identification module, which identification modules are connected to the mobile devices, in which communications method the user identifications of the users are each transmitted by means of one of the mobile device to a visitor location register and are stored there, and in which communications method the user identifications are each linked to a call number and to further user data and are stored in a home location register, the user data comprising location information for a respective user, and the location information being transmitted from a visitor location register to the home location register of a user, wherein

at least certain of the mobile devices are connected by the users to a low voltage grid in each case by means of a connecting module, the respective connecting module being connected to the low voltage network in each case by means of a connecting plug of the respective connecting module via outlets of the low voltage network, and the respective connecting module being connected to the respective mobile device by means of an interface module of the respective connecting module, and

the respective mobile device, by means of a suitable power line communications module of the respective connecting module communicates, via the low voltage network, with other units, which are connected to the low voltage grid via a power line communications module.

17. (Amended) The communications method according to claim 16, wherein at least one visitor location register is connected to at least one low voltage grid via a power line communications module, and the user identifications of respective mobile devices are transmitted to this power supply network visitor location register via the low voltage grid.

18. (Amended) The communications method according to claim 17, wherein address data relating to connecting modules are linked with associated user identifications and are stored in a table of the power supply network visitor location register.

19. (Amended) The communications method according to claim 18, wherein the power supply network visitor location register transmits to the home location register of a user a roaming number relating to the mobile device of this user, and wherein roaming numbers are additionally linked in the table with associated user identifications and are stored.

20. (Amended) The communications method according to claim 19, wherein at least certain of the roaming numbers comprise address data relating to a connecting module.

21. (Amended) The communications method according to claim 17, wherein at least certain pieces of the location information comprise address data relating to a power supply network visitor location register.

22. (Amended) The communications method according to claim 17, wherein the power supply network visitor location register communicates, via a connecting network, with at least one home location register and/or at least one mobile switching center.

23. (Amended) The communications method according to claim 22, wherein the connecting network comprises a SS7 signalling system or is the Internet or an intranet.

24. (Amended) The communications method according to claim 22, wherein the power supply network visitor location register communicates by means of MAP messages with other network units connected to the connecting network.

25. (Amended) The communications method according to claim 22, wherein the power supply network visitor location register passes on calls from terminals, by means of a gateway module to respective at least certain mobile devices, which calls have been passed on via the connecting network to the power supply network visitor location register, and wherein the power supply network visitor location register passes on, by means of this gateway module, calls from the at least certain mobile devices via the connecting network to a respective network unit, in particular a second power supply network visitor location register, for further transmission to a called terminal.

26. (Amended) The communications method according to claim 17, wherein the power supply network visitor location register passes on, to respective at least certain mobile devices, by means of a gateway module calls, which have been received by a mobile switching center from calling terminals and have been passed on to the power supply network visitor location register, or respectively passes on to a respective mobile switching center, by means of this gateway module, calls from at least certain mobile devices for further transmission to a called terminal.

27. (Amended) The communications method according to claim 17, wherein the power supply network visitor location register records and bills for services, which have been carried out for a respective at least certain mobile device, by means of a billing module.

28. (Amended) The communications method according to claim 16, wherein the

billing module bills recorded services to a respective at least certain mobile device directly via the low voltage grid.

29. (Amended) The communications method according to claim 16, wherein the interface module comprises an interface with contacts, a contactless infrared interface, a contactless inductive interface and/or a contactless high frequency radio interface.

30. (Amended) The communications method according to claim 16, wherein, by means of charging modules, the connecting modules charge on the low voltage grid energy storage devices for operation of the mobile devices.

31. (Amended) A connecting module for a communications system according to claim 1,

which connecting module is set up in such a way that users of mobile devices are able to connect at least certain of the mobile devices to the low voltage grid in each case by means of the connecting module, the connecting module comprising a connecting plug for connection to the low voltage grid, by means of which connecting plug the connecting module is connectible to the low voltage grid via outlets of the low voltage grid, and the connecting module comprising an interface module for connection with a respective mobile device, and

which connecting module comprises a suitable power line communications module, by means of which the respective mobile device is able to communicate via the low voltage grid with other units which are connected to the low voltage grid via a power line communications module.

32. (Amended) The connecting module according to claim 31, wherein it has stored address data by means of which it is addressable in the low voltage grid.

33. (Amended) The connecting module according to claim 31, wherein the interface module comprises an interface with contacts, a contactless infrared interface, a contactless inductive interface and/or a contactless high frequency radio interface.

34. (Amended) The connecting module according to claim 31, wherein it comprises a charging module by means of which an energy storage device for operation of a mobile device is chargeable on the low voltage grid.

35. (Amended) The connecting module according to claim 31, wherein the at least certain mobile devices each comprise a mobile radio telephone.

REMARKS

Favorable consideration of this application, as presently amended, is respectfully requested.

The present preliminary amendment is submitted to amend the claims to cancel all multiple dependencies and to delete all reference numerals.

The present application is believed to be in condition for a full and thorough examination on the merits. An early and favorable consideration of the present application is

hereby respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Gregory J. Maier
Attorney of Record
Registration No. 25,599
Surinder Sachar
Registration No. 34,423



22850

(703) 413-3000
Fax #: (703) 413-2220
SNS/js

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Marked-Up Copy

Serial No: _____

Amendment Filed on: _____

*6-25-01*IN THE CLAIMS

--1. (Amended) A communications system, which comprises a multiplicity of mobile devices [(1, 91')], to which an identification module [(12)] is connected in each case, in which identification modules [(12)] a user identification [(123)] of the user of the respective mobile device [(1)] is stored in each case, which communications system comprises at least one visitor location register [(5)], to which visitor location register [(5)] user identifications [(123)] of the users are transmitted each by means of one of the mobile devices [(1)] and are stored there, and which communications system comprises at least one home location register [(6)], in which the user identifications are each linked to a call number and to further user data, which user data comprise location information for a respective user, the location information being transmitted from a visitor location register [(5)] to the home location register [(6)] of a user, wherein

it comprises connecting modules [(2, 2')], by means of which connecting modules [(2, 2')] one of the mobile devices in each case is connectible by a user to a lower voltage grid [(41)], the connecting modules [(2, 2')] each comprising a connecting plug for connection to the low voltage grid [(41)], by means of which connecting plugs the connecting modules [(2, 2')] are each connectible to the low voltage grid [(41)] via outlets [(3, 3')] of the low voltage

grid [(41)], and the connecting modules [(2, 2')] comprising an interface module for connection to the respective mobile device [(1)], and

the connecting modules [(2, 2')] each comprise a suitable power line communications module [(21)] by means of which the respective mobile device [(1)] is able to communicate via the low voltage grid [(41)] with other units [(5)] which are connected to the low voltage grid [(41)] via a power line communications module [(51)].

2. (Amended) The communications system according to [the preceding] claim 1, wherein it comprises at least one visitor location register [(5)] which is connected to at least one low voltage grid [(41)] via the power line communications module [(51)], and wherein user identifications [(123)] are transmittable to this power supply network visitor location register [(5)] via the low voltage grid [(41)] by respective mobile devices [(1)].

3. (Amended) The communications system according to [the preceding] claim 2, wherein the power supply network visitor location register [(5)] comprises a table [(54)] in which address data relating to connecting modules [(2, 2')] are linked to associated user identifications and are stored.

4. (Amended) The communications system according to [the preceding] claim 3, wherein the power supply network visitor location register [(5)] transmits to the home location register [(6, 6')] of a user a roaming number relating to the mobile device [(1)] of this user, and wherein the roaming numbers are additionally linked in the table [(54)] with associated user identifications and are stored.

5. (Amended) The communications system according to [the preceding] claim 4, wherein at least certain of the roaming numbers comprise address data relating to a connecting module [(2, 2')].

6. (Amended) The communications system according to [one of the claims] claim 2 [to 5], wherein at least certain pieces of the location information comprise address data relating to the power supply network visitor location register [(5)].

7. (Amended) The communications system according to [one of the claims] claim 2 [to 6], wherein the communications system comprises a connecting network [(8)] via which the power supply network visitor location register [(5)] is able to communicate with at least one home location register [(6)] and/or at least one mobile switching center [(7)].

8. (Amended) The communications system according to [the preceding] claim 7, wherein the connecting network [(8)] comprises a SS7 signalling system, or is the Internet or an intranet.

9. (Amended) The communications system according to [one of the claims] claim 7 [to 8], wherein the power supply network visitor location register [(5)] is set up in such a way that it is able to communicate, by means of MAP messages, with other network units [(6, 6', 7)] connected to the connecting network [(8)].

10. (Amended) The communications system according to [one of the claims] claim 7 [to 9], wherein the power supply network visitor location register [(5)] comprises a gateway module [(53)], which gateway module [(53)] is able to pass on calls from terminals to respective mobile devices [(1)], which calls have been passed on via the connecting network [(8)] to the power supply network visitor location register [(5)], and which gateway module

[(53)] is able to pass on calls from respective mobile devices [(1)] via the connecting network [(8)] to a respective network unit, in particular a second power supply network visitor location register, for further transmission to a called terminal.

11. (Amended) The communications system according to [one of the claims] claim 2 [to 10], wherein the power supply network visitor location register [(5)] comprises a gateway module [(53)], which gateway module [(53)] is able to pass on calls from terminals [(91, 91')] to respective mobile devices [(1)], which calls have been received from a mobile switching center [(7)] and have been passed on to the power supply network visitor location register [(5)], and which gateway module [(53)] is able to pass on to a respective mobile switching center [(7)] calls from respective mobile devices [(1)] for further transmission to a called terminal [(91, 91')].

12. (Amended) The communications system according to [one of the claims] claim 2 [to 11], wherein the power supply network visitor location register [(5)] comprises a billing module [(52)] which is able to record and bill for services that have been carried out for a respective mobile device [(1)].

13. (Amended) The communications system according to [the preceding] claim 12, wherein the billing module [(52)] is able to bill recorded services to a respective mobile device [(1)] directly via the low voltage grid [(41)].

14. (Amended) The communications system according to [one of the preceding claims] claim 1, wherein the interface module [(23)] comprises an interface with contacts, a contactless infrared interface, a contactless inductive interface and/or a contactless high frequency radio interface.

15. (Amended) The communications system according to [one of the preceding claims] claim 1, wherein the connecting modules [(2,2')] comprise charging modules by means of which energy storage devices for operation of the mobile devices [(1)] are chargeable on the low voltage grid [(41)].

16. (Amended) A communications method in which user identifications [(123)] of users of a multiplicity of mobile devices [(1, 91')] are each stored in an identification module [(12)], which identification modules [(12)] are connected to the mobile devices [(1, 91)], in which communications method the user identifications [(123)] of the users are each transmitted by means of one of the mobile device [(1)] to a visitor location register [(5)] and are stored there, and in which communications method the user identifications are each linked to a call number and to further user data and are stored in a home location register [(6)], the user data comprising location information for a respective user, and the location information being transmitted from a visitor location register [(5)] to the home location register [(6)] of a user, wherein

at least certain of the mobile devices [(1)] are connected by the users to a low voltage grid [(41)] in each case by means of a connecting module [(2)], the respective connecting module [(2, 2')] being connected to the low voltage network [(41)] in each case by means of a connecting plug of the respective connecting module [(2, 2')] via outlets [(3, 3')] of the low voltage network [(41)], and the respective connecting module [(2, 2')] being connected to the respective mobile device [(1)] by means of an interface module [(23)] of the respective connecting module [(2, 2')], and

the respective mobile device [(1)], by means of a suitable power line communications module [(21)] of the respective connecting module [(2, 2')] communicates, via the low voltage network [(41)], with other units [(5)], which are connected to the low voltage grid [(41)] via a power line communications module [(51)].

17. (Amended) The communications method according to [the preceding] claim 16, wherein at least one visitor location register [(5)] is connected to at least one low voltage grid [(41)] via a power line communications module [(51)], and the user identifications [(123)] of respective mobile devices [(1)] are transmitted to this power supply network visitor location register [(5)] via the low voltage grid [(41)].

18. (Amended) The communications method according to [the preceding] claim 17, wherein address data relating to connecting modules [(2, 2')] are linked with associated user identifications and are stored in a table [(54)] of the power supply network visitor location register [(5)].

19. (Amended) The communications method according to [the preceding] claim 18, wherein the power supply network visitor location register [(5)] transmits to the home location register [(6, 6')] of a user a roaming number relating to the mobile device [(1)] of this user, and wherein roaming numbers are additionally linked in the table [(54)] with associated user identifications and are stored.

20. (Amended) The communications method according to [the preceding] claim 19, wherein at least certain of the roaming numbers comprise address data relating to a connecting module [(2, 2')].

21. (Amended) The communications method according to [one of the claims] claim 17 [to 20], wherein at least certain pieces of the location information comprise address data relating to a power supply network visitor location register [(5)].

22. (Amended) The communications method according to [one of the claims] claim 17 [to 21], wherein the power supply network visitor location register [(5)] communicates, via a connecting network [(8)], with at least one home location register [(6)] and/or at least one mobile switching center [(7)].

23. (Amended) The communications method according to [the preceding] claim 22, wherein the connecting network [(8)] comprises a SS7 signalling system or is the Internet or an intranet.

24. (Amended) The communications method according to [one of the claims] claim 22 [to 23], wherein the power supply network visitor location register [(5)] communicates by means of MAP messages with other network units [(6, 6', 7)] connected to the connecting network [(8)].

25. (Amended) The communications method according to [one of the claims] claim 22 [to 24], wherein the power supply network visitor location register [(5)] passes on calls from terminals, by means of a gateway module [(53)] to respective at least certain mobile devices [(1)], which calls have been passed on via the connecting network [(8)] to the power supply network visitor location register [(5)], and wherein the power supply network visitor location register [(5)] passes on, by means of this gateway module [(53)], calls from the at least certain mobile devices [(1)] via the connecting network [(8)] to a respective network

unit, in particular a second power supply network visitor location register, for further transmission to a called terminal.

26. (Amended) The communications method according to [one of the claims] claim 17 [to 25], wherein the power supply network visitor location register [(5)] passes on, to respective at least certain mobile devices [(1)], by means of a gateway module [(53)], calls, which have been received by a mobile switching center [(7)] from calling terminals [(91, 91')] and have been passed on to the power supply network visitor location register [(5)], or respectively passes on to a respective mobile switching center [(7)], by means of this gateway module [(53)], calls from at least certain mobile devices [(1)] for further transmission to a called terminal [(91, 91')].

27. (Amended) The communications method according to [one of the claims] claim 17 [to 26], wherein the power supply network visitor location register [(5)] records and bills for services, which have been carried out for a respective at least certain mobile device [(1)], by means of a billing module [(52)].

28. (Amended) The communications method according to [one of the claims] claim 16 [to 27], wherein the billing module [(52)] bills recorded services to a respective at least certain mobile device [(1)] directly via the low voltage grid [(41)].

29. (Amended) The communications method according to [one of the claims] claim 16 [to 28], wherein the interface module [(23)] comprises an interface with contacts, a contactless infrared interface, a contactless inductive interface and/or a contactless high frequency radio interface.

30. (Amended) The communications method according to [one of the claims] claim 16 [to 29], wherein, by means of charging modules, the connecting modules [(2, 2')] charge on the low voltage grid [(41)] energy storage devices for operation of the mobile devices [(1)].

31. (Amended) A connecting module [(2, 2')] for a communications system according to [one of the claims] claim 1 [to 15],

which connecting module [(2, 2')] is set up in such a way that users of mobile devices [(1)] are able to connect at least certain of the mobile devices [(1)] to the low voltage grid [(41)] in each case by means of the connecting module [(2, 2')], the connecting module [(2, 2')] comprising a connecting plug for connection to the low voltage grid [(41)], by means of which connecting plug the connecting module is connectible to the low voltage grid [(41)] via outlets [(3, 3')] of the low voltage grid [(41)], and the connecting module [(2, 2')] comprising an interface module [(23)] for connection with a respective mobile device [(1)], and

which connecting module [(2, 2')] comprises a suitable power line communications module [(21)], by means of which the respective mobile device [(1)] is able to communicate via the low voltage grid [(41)] with other units which are connected to the low voltage grid [(41)] via a power line communications module [(51)].

32. (Amended) The connecting module [(2, 2')] according to [the preceding] claim 31, wherein it has stored address data by means of which it is addressable in the low voltage grid [(41)].

33. (Amended) The connecting module [(2, 2')] according to [one of the claims] claim 31 [to 32], wherein the interface module [(23)] comprises an interface with contacts, a

contactless infrared interface, a contactless inductive interface and/or a contactless high frequency radio interface.

34. (Amended) The connecting module [(2, 2')] according to [one of the claims] claim 31 [to 33], wherein it comprises a charging module by means of which an energy storage device for operation of a mobile device [(1)] is chargeable on the low voltage grid [(41)].

35. (Amended) The connecting module according to [one of the claims] claim 31 [to 34], wherein the at least certain mobile devices [(1)] each comprise a mobile radio telephone.--

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JCO3 Rec'd PCT/PTC 25 JUN 2001

THE FOLLOWING IS THE ENGLISH TRANSLATION OF THE
AMENDMENTS TO THE CLAIMS OF THE INTERNATIONAL
APPLICATION UNDER PCT ARTICLE 19: AMENDED SHEETS
(Pages 14-23).

Claims

1. A communications system, which comprises a multiplicity of mobile devices (1, 91'), to which an identification module (12) is connected in each case, in which identification modules (12) a user identification (123) of the user
5 of the respective said mobile device (1) is stored in each case, which communications system comprises at least one visitor location register (5), to which visitor location register (5) said user identifications (123) of said users are transmitted by means of a said mobile device (1) and are stored there, and which communications system comprises at least one home location register
10 (6), in which said user identifications are each linked to a call number and to further user data, which user data comprise location information for a respective said user, said location information being transmitted from a said visitor location register (5) to the home location register (6) of a said user, wherein
15 it comprises connecting modules (2, 2'), which are set up in such a way that said users are able to connect at least certain said mobile devices (1) to a power supply network (4) in each case by means of a said connecting module (2, 2'),
said connecting modules (2, 2') each comprise a suitable power line
20 communications module (21), by means of which said at least certain mobile devices (1) are able to communicate, via a said power supply network (4), with other units (5) which are connected to a said power supply network (4) via a power line communications module (51).
2. The communications system according to the preceding claim,
25 wherein it comprises at least one visitor location register (5) which is connected to at least one said power supply network (4) via a said power line communications module (51), and
wherein said user identifications (123) are transmitted by said at least certain mobile devices (1) via the said power supply network (4) to this power
30 supply network visitor location register (5).

3. The communications system according to the preceding claim,

AMENDED PAGE (ARTICLE 19)

wherein a said power supply network visitor location register (5) comprises a table (54) in which address data relating to said connecting modules (2, 2') are linked to associated said user identifications and are stored.

4. The communications system according to the preceding claim,
 5 wherein a said power supply network visitor location register (5) transmits to the said home location register (6, 6') of a said user a roaming number relating to the said mobile device (1) of this said user, and wherein said roaming numbers are additionally linked in the said table (54) with associated said user identifications and are stored.

10 5. The communications system according to the preceding claim, wherein at least certain of the said roaming numbers comprise address data relating to a said connecting module (2, 2').

6. The communications system according to one of the preceding claims, wherein at least certain pieces of the said location information comprise
 15 address data relating to the said power supply network visitor location register (5).

7. The communications system according to one of the preceding claims, wherein the communications system comprises a connecting network (8) via which a said power supply network visitor location register (5) is able to
 20 communicate with at least one said home location register (6) and/or at least one mobile switching center (7).

8. The communications system according to the preceding claim, wherein the said connecting network (8) comprises a SS7 signalling system.

9. The communications system according to claim 7, wherein the said
 25 connecting network (8) is the Internet or an intranet.

10. The communications system according to one of the claims 7 to 9, wherein the said at least one power supply network visitor location register (5) is able to communicate, by means of MAP messages, with other network units (6, 6', 7) connected to the said connecting network (8).

30 11. The communications system according to one of the claims 7 to 10, wherein the said at least one power supply network visitor location register (5)

comprises a gateway module (53), which gateway module (53) is able to pass on calls from terminals to respective said at least certain mobile devices (1), which calls have been passed on via the said connecting network (8) to the said power supply network visitor location register (5), and which gateway
 5 module (53) is able to pass on calls from said at least certain mobile devices (1) via the said connecting network (8) to a respective network unit, in particular a second said power supply network visitor location register, for further transmission to a called terminal.

12. The communications system according to one of the preceding
 10 claims, wherein the said at least one power supply network visitor location register (5) comprises a gateway module (53), which gateway module (53) is able to pass on calls from terminals (91, 91') to respective said at least certain mobile devices (1), which calls have been received from a mobile switching center (7) and have been passed on to the said at least one power supply
 15 network visitor location register (5), and which gateway module (53) is able to pass on to a respective said mobile switching center (7) calls from said at least certain mobile devices (1) for further transmission to a called terminal (91, 91').

13. The communications system according to one of the preceding claims, wherein a said at least one power supply network visitor location
 20 register (5) comprises a billing module (52) which is able to record and bill for services that have been carried out for a respective said at least certain mobile device (1).

14. The communications system according to the preceding claim, wherein the said billing module (52) is able to bill recorded services to a
 25 respective said at least certain mobile device (1) directly via the said power supply network (4).

15. The communications system according to one of the preceding claims, wherein the said connecting modules (2, 2') comprise an interface with contacts via which they are able to be connected to said at least certain mobile
 30 devices (1).

16. The communications system according to one of the preceding claims, wherein the said connecting modules (2, 2') comprise a contactless

interface via which they are able to be connected to said at least certain mobile devices (1).

17. The communications system according to the preceding claim, wherein at least certain said contactless interfaces are infrared interfaces.

5 18. The communications system according to one of the claims 16 or 17, wherein at least certain said contactless interfaces are inductive interfaces.

19. The communications system according to one of the claims 16 to 18, wherein at least certain said contactless interfaces are high frequency radio interfaces.

10 20. The communications system according to one of the preceding claims, wherein the said connecting modules (2,2') comprise charging modules by means of which energy storage devices for operation of the said mobile devices (1) are able to be charged on the said power supply network (4).

15 21. The communications system according to one of the preceding claims, wherein the said power supply network (4) is a low voltage grid (41).

22. A communications method in which user identifications (123) of users of a multiplicity of mobile devices (1, 91') are each stored in an identification module (12), which identification modules (12) are connected to said mobile devices (1, 91), in which communications method said user identifications (123) of said users are transmitted by means of a said mobile device (1) to a visitor location register (5) and are stored there, and in which communications method said user identifications are each linked to a call number and to further user data and are stored in a home location register (6), said user data comprising location information for a respective said user, and
20 identifications (123) of said users are transmitted by means of a said mobile device (1) to a visitor location register (5) and are stored there, and in which communications method said user identifications are each linked to a call number and to further user data and are stored in a home location register (6), said user data comprising location information for a respective said user, and
25 said location information being transmitted from a said visitor location register (5) to the home location register (6) of a said user, wherein

at least certain said mobile devices (1) are connected by said users to a power supply network (4) in each case by means of a connecting module (2),

30 said connecting modules (2) each comprise a suitable power line communications module (21), by means of which said at least certain mobile devices (1) communicate, via a said power supply network (4), with other units

(5) which are connected to a said power supply network (4) via a power line communications module (51).

23. The communications method according to the preceding claim,
 wherein at least one visitor location register (5) is connected to at least one
 5 said power supply network (4) via a said power line communications module
 (51), and

said user identifications (123) of said at least certain mobile devices (1)
 are transmitted to this power supply network visitor location register (5) via the
 said power supply network (4).

10 24. The communications method according to one of the claims 22 or 23,
 wherein address data relating to connecting modules (2, 2') are linked with
 associated said user identifications and are stored in a table (54) of a said
 power supply network visitor location register (5).

25. The communications method according to the preceding claim,
 15 wherein a said power supply network visitor location register (5) transmits to
 the said home location register (6, 6') of a said user a roaming number relating
 to the said mobile device (1) of this said user, and wherein said roaming
 numbers are additionally linked in the said table (54) with associated said user
 identifications and are stored.

20 26. The communications method according to the preceding claim,
 wherein at least certain of the said roaming numbers comprise address data
 relating to a said connecting module (2, 2').

27. The communications method according to one of the claims 22 to 26,
 wherein at least certain pieces of the said location information comprise
 25 address data relating to a said power supply network visitor location register
 (5).

28. The communications method according to one of the claims 22 to 27,
 wherein a said power supply network visitor location register (5) communicates,
 via a connecting network (8), with at least one said home location register (6)
 30 and/or at least one mobile switching center (7).

29. The communications method according to the preceding claim,

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wherein the said connecting network (8) comprises a SS7 signalling system.

30. The communications method according to claim 28, wherein the said connecting network (8) is the Internet or an Intranet.

31. The communications method according to one of the claims 28 to 30,
5 wherein the said at least one power supply network visitor location register (5) communicates by means of MAP messages with other network units (6, 6', 7) connected to the said connecting network (8).

32. The communications method according to one of the claims 28 to 31,
10 wherein the said at least one power supply network visitor location register (5) passes on calls from terminals, by means of a gateway module (53) to respective said at least certain mobile devices (1), which calls have been passed on via the said connecting network (8) to the said at least one power supply network visitor location register (5), and wherein the said at least one power supply network visitor location register (5) passes on, by means of this
15 gateway module (53), calls from said at least certain mobile devices (1) via the said connecting network (8) to a respective network unit, in particular a second said power supply network visitor location register, for further transmission to a called terminal.

33. The communications method according to one of the claims 22 to 32,
20 wherein the said at least one power supply network visitor location register (5) passes on, to respective said at least certain mobile devices (1), by means of a gateway module (53), calls, which have been received by a mobile switching center (7) from calling terminals (91, 91') and have been passed on to the said at least one power supply network visitor location register (5), or respectively
25 passes on to a respective said mobile switching center (7), by means of this gateway module (53), calls from said at least certain mobile devices (1) for further transmission to a called terminal (91, 91').

34. The communications method according to one of the claims 22 to 33,
30 wherein a said power supply network visitor location register (5) is able to record and bill for services, which have been carried out for a respective said at least certain mobile device (1), by means of a billing module (52).

35. The communications method according to one of the claims 22 to 34,

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wherein the said billing module (52) is able to bill recorded services to a respective said at least certain mobile device (1) directly via the said power supply network (4).

36. The communications method according to one of the claims 22 to 35,
5 wherein the said connecting modules (2, 2') are connected to said at least certain mobile devices (1) via an interface with contacts.

37. The communications method according to one of the claims 22 to 36, wherein the connecting modules (2, 2') are connected to said at least certain mobile devices (1) via a contactless interface.

10 38. The communications method according to the preceding claim, wherein at least certain said contactless interfaces are infrared interfaces.

39. The communications method according to one of the claims 37 to 38, wherein at least certain said contactless interfaces are inductive interfaces.

15 40. The communications method according to one of the claims 37 to 39, wherein at least certain said contactless interfaces are high frequency radio interfaces.

41. The communications method according to one of the claims 22 to 40, wherein, by means of charging modules, said connecting modules (2, 2') charge on the said power supply network (4) energy storage devices for
20 operation of the said mobile devices (1).

42. The communications method according to one of the claims 22 to 41, wherein the said power supply network (4) is a low voltage grid (41).

43. A connecting module (2, 2') for a communications system according to claims 1 to 21,

25 which connecting module (2, 2') is set up in such a way that users of mobile devices (1) are able to connect at least certain said mobile devices (1) to a power supply network (4) in each case by means of a said connecting module (2, 2'), and

30 which connecting module (2, 2') comprises a suitable power line communications module (21), by means of which said at least certain

mobile devices (1) are able to communicate via the said power supply network (4) with other units (5) which are connected to a power supply network (4) via a power line communications module (51).

44. The connecting module (2, 2') according to the preceding claim,
5 wherein it has stored address data by means of which it is able to be addressed in the said power supply network (4).

45. The connecting module (2, 2') according to one of the claims 43 or 44, wherein it comprises an interface with contacts via which it is able to be connected to said at least certain mobile devices (1).

10 46. The connecting module (2, 2') according to one of the claims 43 to 45, wherein it comprises a contactless interface via which it is able to be connected to said at least certain mobile devices (1).

47. The connecting module (2, 2') according to the preceding claim, wherein the said contactless interface is an infrared interface.

15 48. The connecting module (2, 2') according to one of the claims 46 or 47, wherein the said contactless interface is an inductive interface.

49. The connecting module (2, 2') according to one of the claims 46 to 48, wherein the said contactless interface is a high frequency radio interface.

20 50. The connecting module (2, 2') according to one of the claims 43 to 49, wherein it comprises a charging module by means of which an energy storage device for operation of a said mobile device (1) can be charged on the said power supply network (4).

51. The connecting module (2, 2') according to one of the claims 43 to 50, wherein the said power supply network (4) is a low voltage grid (41).

25 52. The connecting module according to one of the claims 43 to 50, wherein said at least certain mobile devices (1) each comprise a mobile radio telephone.

53. A visitor location register (5) for a communications system according to the claims 1 to 21,

30 which visitor location register (5) comprises a power line communica-

power supply network (4),

which visitor location register (5) is set up in such a way that it is able to receive and store user identifications which are transmitted by users by means of a mobile device (1) to the visitor location register (5), said user identifications
 5 being received via a said power supply network (4) by the visitor location register from at least certain said mobile devices (1), which are connected in each case to a said power supply network (4) via a connecting module (2, 2'),

and which visitor location register (5) is set up in such a way that it is able to pass on location information for a said user to his home location
 10 register (6).

54. The visitor location register (5) according to the preceding claim, wherein it comprises a table (54) in which address data relating to said connecting modules (2, 2') are linked with associated said user identifications and are stored.

15 55. The visitor location register (5) according to the preceding claim, wherein it (5) transmits to the home location register (6, 6') of a said user a roaming number relating to the said mobile device (1) of this said user, and wherein said roaming numbers are additionally linked in the said table (54) with associated said user identifications and are stored.

20 56. The visitor location register (5) according to the preceding claim, wherein at least certain of the said roaming numbers comprise address data relating to a said connecting module (2, 2').

57. The visitor location register (5) according to one of the claims 53 to 56, wherein it is able to communicate, via a connecting network (8), with at
 25 least one said home location register (6) and/or at least one mobile switching center (7).

58. The visitor location register (5) according to the preceding claim, wherein the said connecting network (8) comprises a SS7 signalling system.

59. The visitor location register (5) according to claim 57, wherein the

said connecting network (8) is the Internet or an intranet.

60. The visitor location register (5) according to one of the claims 57 to 59, wherein the visitor location register (5) is able to communicate by means of MAP messages with other network units (6, 6', 7) which are connected to the
5 said connecting network (8).

61. The visitor location register (5) according to one of the claims 57 to 60, wherein it comprises a gateway module (53), which gateway module (53) is able to receive calls from terminals, which calls have been passed on to the visitor location register (5) via the said connecting network (8), and is able to
10 pass them on to respective said at least certain mobile devices (1), and which gateway module (53) is able to pass on calls from said at least certain mobile devices (1) via the said connecting network (8) to a respective network unit, in particular a second said visitor location register, for further transmission to a called terminal.

15 62. The visitor location register (5) according to one of the claims 53 to 61, wherein it comprises a gateway module (53), which is able to pass on calls to respective said at least certain mobile devices (1) that have been received by a mobile switching center (7) from calling terminals (91, 91') and have been passed on to the visitor location register (5), or respectively is able to pass on
20 to a respective mobile switching center (7) calls from said at least certain mobile devices (1) for further transmission to a called terminal (91, 91').

63. The visitor location register (5) according to one of the claims 53 to 62, wherein it comprises a billing module (52) which is able to record and bill for services that have been carried out for a respective said at least certain
25 mobile device (1).

64. The visitor location register (5) according to the preceding claim, wherein the said billing module (52) is able to bill recorded services to a respective said at least certain mobile device (1) directly via the said power supply network (4).

30 65. The visitor location register (5) according to one of the claims 53 to 64, wherein the said power supply network (4) is a low voltage grid (41).

THE FOLLOWING IS THE ENGLISH TRANSLATION OF THE
ANNEXES TO THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT : AMENDED SHEETS (Pages 2-5, 5a, 5b
and 14-20).

roaming of mobile devices in VPLMN, this is only possible if a user is located in the radio range covered by the VPLMN. In particular in big countries with areas that are thinly populated, for example, it can very well be that radio coverage is ensured only in the population centers. Moreover there are
 5 buildings and facilities in which no good radio reception is possible.

Described in the patent application GB 2 322 998 A is a method for connection of communications networks which makes it possible for users to communicate with their mobile devices in visited areas that are covered by radio by one network operator only with whom respective users do not have
 10 any subscriber agreement. According to the teachings of GB 2 322 998 A, a corresponding registration request is passed on from a visited communications network to an international roaming platform, which checks whether the visited communications network and the home network of the respective visiting user has concluded a service agreement. If applicable, the international roaming
 15 platform passes on the registration request to the home location register (HLR) of the home network, according to GB 2 322 998 A. The user data for authentication of the respective visiting user are transmitted, according to GB 322 998 A, from the HLR of the home network via the international roaming platform to the visited communications network, the user data are stored in the
 20 visitor location register (VLR) of the visited communications network, and location information concerning the visiting user are stored in the HLR of the home network of the user.

Described in the patent application WO 98/28865 are a device and method for cordless communication in a means of conveyance, for example in
 25 a train, a subway train or a streetcar. According to the teaching described in WO 98/28865, in the means of conveyance, at least one base station, which is set up for cordless communication with cordless telephones, is firmly connected to at least one transceiver that is connected to the power cable of the means of conveyance. According to the teaching of WO 98/28865, the
 30 base station(s) as well as the transceiver(s) are mounted in the interior or on the exterior of the means of conveyance. A passenger with a cordless telephone can communicate, according to the teaching of WO 98/28865, via the base station, firmly mounted in the means of conveyance, via the fixed

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connection of this base station to the transceiver, firmly mounted in the means of conveyance, and from this transceiver, via the power cable of the means of conveyance, with firmly installed transceivers that are set up along the conveyance route and are likewise connected to the power cable. From the transceivers, set up along the conveyance route, the path of communication can be continued via a connected communications network, according to the teaching of WO 98/28865.

It is an object of this invention to propose a new communications system, a new communications method as well as new devices suitable therefor, which make it possible for users of mobile devices in particular to communicate with their mobile devices in areas that are not covered by radio and/or are covered by radio only by a network operator with whom respective users have no subscriber agreement.

This object is attained according to the present invention through the elements of the independent claims. Further preferred embodiments follow moreover from the dependent claims and from the specification.

In particular, this object is achieved through the invention in that at least certain mobile devices, for example mobile radio telephones or laptop or palmtop computers with suitable communications modules for mobile networks, for example GSM or UMTS networks, are able to be connected in each case to a low voltage grid by their users by means of a connecting module, the connecting module comprising in each case a connecting plug for connection to the low voltage grid, by means of which connecting plugs the connecting module is connectible to the low voltage grid in each case via outlets of the low voltage grid, and the connecting module comprising an interface for connection with the respective mobile device, and in that the connecting module comprises a suitable power line communications module by means of which the respective mobile device is able to communicate via the low voltage grid with other units that are connected to the low voltage grid via a power line communications module. This has the advantage that these mobile devices are able to communicate also in areas that do not lie within the radio range of a mobile

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network and/or which lie in the radio range of a mobile network for which the user of the respective mobile device has no subscriber agreement, but have a power supply network, in particular a low voltage grid, to which these mobile devices can be connected.

5 Described in the patent publication DE 40 31 092 A1 is a telephone system in which connection of a telephone apparatus to the public telephone network is made possible with the aid of two modems, via current distribution lines. The advantage of the invention described in DE40 31 092 A1 consists in that too big a distance of a telephone apparatus to a telephone connection jack
10 can be bridged over with the modem connection to a power supply line and with the modem connection of the telephone connection jack to this power supply line. The invention described in DE 40 31 092 A1 has as a prerequisite a local telephone connection, and is suitable only for a terminal which is supposed to be connected to the public telephone network via this telephone connection.

15 The communications system according to the present invention preferably comprises at least one visitor location register (VLR) which is connected to at least one said power supply network via a said power line communications module, and the mobile devices connected to a power supply network transmit user identifications, stored in identification modules removably
20 connected to the mobile devices, via a power supply network to this power supply network VLR. These mobile devices, or respectively their users, are thereby able to register themselves with the VLR in a similar way as in a conventional mobile network.

In an embodiment variant, such a power supply network VLR comprises
25 a table in which address data relating to the said connecting modules are linked with the associated said user identifications and are stored. This has the advantage that a respective connecting module and the mobile device associated therewith, or respectively its user, can be identified and addressed in a power supply network.

30 In a preferred embodiment variant, in addition, roaming numbers are linked in this table with associated user identifications and stored. As in a

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conventional mobile network, such roaming numbers can be transmitted from the power supply network VLR, either upon request or automatically, to the home location register of a respective user, where they are used for forwarding of calls to the respective mobile device in a power supply network.

5 In a conventional mobile network, location information, among other things, is stored in the HLR of a user for this user, which information is transmitted, for example, from a visitor location register (VLR) of a VPLMN to the HLR. The location information, which is transmitted from the power supply network VLR to the HLR of a user, preferably comprises address data relating
10 to the said power supply network VLR, by means of which the location of the respective user is determined and the power supply network VLR can be addressed.

In an embodiment variant, the roaming numbers relating to mobile devices in a power supply network comprise address data relating to a said
15 connecting module. Users in a power supply network, or respectively their mobile devices, can thereby be addressed via the associated connecting modules.

In a preferred embodiment, a power supply network VLR is connected to the HLR of the user via a connecting network and/or to a mobile switching
20 center (MSC) in the home mobile network (Home Public Land Mobile Network, HPLMN) of the user. The connecting network 8 <sic.> is, for example, a local or wide area network (LAN or WAN), a dedicated backbone, an intranet or the Internet, and comprises, for example, a signalling system number 7 (SS7). The power supply network VLR can communicate with other network units
25 connected to the connecting network, for example by means of MAP messages.

The power supply network VLR preferably comprises a gateway module, which is able to pass on calls from terminals to respective mobile devices, hooked up to a power supply network, connected to the power supply network VLR, which calls have been passed on to the said power supply network VLR
30 via the said connecting network, and which gateway module is able to pass on calls from said mobile devices, hooked up to a power supply network, connected to the power supply network VLR, via the said connecting network, to a

respective network unit, in particular a second said power supply network visitor location register, for further transmission to a called terminal. Such a gateway module extends the functionality of the power supply network VLR with functions that are typically carried out in a switching center, for example in a mobile switching center (MSC), so that calls can be passed on, for example also between a plurality of power supply network VLRs that are connected to different power supply networks.

The gateway module is preferably able to pass on calls to respective mobile devices connected to the power supply network that are received by a mobile switching center from calling terminals and have been passed on to the power supply network VLR, or respectively pass on to a respective mobile switching center calls from mobile devices connected to the power supply network for further transmission to a called terminal. A power supply network VLR with such a gateway module has the advantage that the communication between mobile devices connected to a power supply network and terminals in conventional mobile networks and/or fixed networks, for example the public switched telephone network (PSTN), can be carried out for the terminals concerned, or respectively for their users, in a transparent way via the power supply network VLR.

In a preferred embodiment, the power supply network VLR comprises a billing module, which is able to record and bill for services which have been carried out for a respective mobile device connected to the power supply network. This embodiment variant has the advantage that the costs are recorded directly at their point of origin, which simplifies the recording of power supply network-specific costs in particular. In an embodiment variant, the billing module can directly bill recorded services to a respective mobile device connected to the power supply network via the said power supply network, for example in that the costs are debited from a prepaid account, which is located, for example, on an identification module removably connected to the respective mobile device, for instance a chipcard. In another embodiment variant, the billing module is able to generate so-called call detail records (CDR) for the recorded services and transmit them to a clearing point for billing.

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In different embodiment variants, the connecting modules comprise an interface with contacts and/or a contactless interface, for example an infrared interface, an inductive interface or a high frequency radio interface, for example a so-called "bluetooth interface" via which they are able to be connected to the said mobile devices.

In an embodiment variant, the connecting modules comprise charging modules, by means of which energy storage devices for operation of the said mobile devices can be charged on the said power supply network.

One embodiment of the present invention will be described in the following with reference to an example. The example of the embodiment is illustrated by the following single, attached figure:

Figure 1 shows an overview diagram with a power supply network, to which a mobile device is connected via a connecting module, and with a

Claims

1. A communications system, which comprises a multiplicity of mobile devices (1, 91'), to which an identification module (12) is connected in each case, in which identification modules (12) a user identification (123) of the user
- 5 of the respective mobile device (1) is stored in each case, which communications system comprises at least one visitor location register (5), to which visitor location register (5) user identifications (123) of the users are transmitted each by means of one of the mobile devices (1) and are stored there, and which communications system comprises at least one home location
- 10 register (6), in which the user identifications are each linked to a call number and to further user data, which user data comprise location information for a respective user, the location information being transmitted from a visitor location register (5) to the home location register (6) of a user, wherein

- it comprises connecting modules (2, 2'), by means of which connecting
- 15 modules (2, 2') one of the mobile devices in each case is connectible by a user to a lower voltage grid (41), the connecting modules (2, 2') each comprising a connecting plug for connection to the low voltage grid (41), by means of which connecting plugs the connecting modules (2, 2') are each connectible to the low voltage grid (41) via outlets (3, 3') of the low voltage grid (41), and the
- 20 connecting modules (2, 2') comprising an interface module for connection to the respective mobile device (1), and

- the connecting modules (2, 2') each comprise a suitable power line communications module (21) by means of which the respective mobile device (1) is able to communicate via the low voltage grid (41) with other units (5)
- 25 which are connected to the low voltage grid (41) via a power line communications module (51).

2. The communications system according to the preceding claim, wherein it comprises at least one visitor location register (5) which is connected to at least one low voltage grid (41) via the power line communications module
- 30 (51), and wherein user identifications (123) are transmittable to this power supply network visitor location register (5) via the low voltage grid (41) by respective mobile devices (1).

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3. The communications system according to the preceding claim, wherein the power supply network visitor location register (5) comprises a table (54) in which address data relating to connecting modules (2, 2') are linked to associated user identifications and are stored.

5 4. The communications system according to the preceding claim, wherein the power supply network visitor location register (5) transmits to the home location register (6, 6') of a user a roaming number relating to the mobile device (1) of this user, and wherein the roaming numbers are additionally linked in the table (54) with associated user identifications and are stored.

10 5. The communications system according to the preceding claim, wherein at least certain of the roaming numbers comprise address data relating to a connecting module (2, 2').

6. The communications system according to one of the claims 2 to 5, wherein at least certain pieces of the location information comprise address data relating to the power supply network visitor location register (5).

7. The communications system according to one of the claims 2 to 6, wherein the communications system comprises a connecting network (8) via which the power supply network visitor location register (5) is able to communicate with at least one home location register (6) and/or at least one
20 mobile switching center (7).

8. The communications system according to the preceding claim, wherein the connecting network (8) comprises a SS7 signalling system, or is the Internet or an intranet.

9. The communications system according to one of the claims 7 to 8, wherein the power supply network visitor location register (5) is set up in such a way that it is able to communicate, by means of MAP messages, with other network units (6, 6', 7) connected to the connecting network (8).

10. The communications system according to one of the claims 7 to 9, wherein the power supply network visitor location register (5) comprises a gateway module (53), which gateway module (53) is able to pass on calls

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from terminals to respective mobile devices (1), which calls have been passed on via the connecting network (8) to the power supply network visitor location register (5), and which gateway module (53) is able to pass on calls from respective mobile devices (1) via the connecting network (8) to a respective network unit, in particular a second power supply network visitor location register, for further transmission to a called terminal.

11. The communications system according to one of the claims 2 to 10, wherein the power supply network visitor location register (5) comprises a gateway module (53), which gateway module (53) is able to pass on calls from terminals (91, 91') to respective mobile devices (1), which calls have been received from a mobile switching center (7) and have been passed on to the power supply network visitor location register (5), and which gateway module (53) is able to pass on to a respective mobile switching center (7) calls from respective mobile devices (1) for further transmission to a called terminal (91, 91').

12. The communications system according to one of the claims 2 to 11, wherein the power supply network visitor location register (5) comprises a billing module (52) which is able to record and bill for services that have been carried out for a respective mobile device (1).

13. The communications system according to the preceding claim, wherein the billing module (52) is able to bill recorded services to a respective mobile device (1) directly via the low voltage grid (41).

14. The communications system according to one of the preceding claims, wherein the interface module (23) comprises an interface with contacts, a contactless infrared interface, a contactless inductive interface and/or a contactless high frequency radio interface.

15. The communications system according to one of the preceding claims, wherein the connecting modules (2,2') comprise charging modules by means of which energy storage devices for operation of the mobile devices (1)

are chargeable on the low voltage grid (41).

16. A communications method in which user identifications (123) of users of a multiplicity of mobile devices (1, 91') are each stored in an identification module (12), which identification modules (12) are connected to the mobile devices (1, 91), in which communications method the user identifications (123) of the users are each transmitted by means of one of the mobile device (1) to a visitor location register (5) and are stored there, and in which communications method the user identifications are each linked to a call number and to further user data and are stored in a home location register (6), the user data comprising location information for a respective user, and the location information being transmitted from a visitor location register (5) to the home location register (6) of a user, wherein

at least certain of the mobile devices (1) are connected by the users to a low voltage grid (41) in each case by means of a connecting module (2), the respective connecting module (2, 2') being connected to the low voltage network (41) in each case by means of a connecting plug of the respective connecting module (2, 2') via outlets (3, 3') of the low voltage network (41), and the respective connecting module (2, 2') being connected to the respective mobile device (1) by means of an interface module (23) of the respective connecting module (2, 2'), and

the respective mobile device (1), by means of a suitable power line communications module (21) of the respective connecting module (2, 2') communicates, via the low voltage network (41), with other units (5), which are connected to the low voltage grid (41) via a power line communications module (51).

17. The communications method according to the preceding claim, wherein at least one visitor location register (5) is connected to at least one low voltage grid (41) via a power line communications module (51), and the user identifications (123) of respective mobile devices (1) are transmitted to this power supply network visitor location register (5) via the low voltage grid (41).

18. The communications method according to the preceding claim, wherein address data relating to connecting modules (2, 2') are linked with

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associated user identifications and are stored in a table (54) of the power supply network visitor location register (5).

19. The communications method according to the preceding claim, wherein the power supply network visitor location register (5) transmits to the home location register (6, 6') of a user a roaming number relating to the mobile device (1) of this user, and wherein roaming numbers are additionally linked in the table (54) with associated user identifications and are stored.

20. The communications method according to the preceding claim, wherein at least certain of the roaming numbers comprise address data relating to a connecting module (2, 2').

21. The communications method according to one of the claims 17 to 20, wherein at least certain pieces of the location information comprise address data relating to a power supply network visitor location register (5).

22. The communications method according to one of the claims 17 to 21, wherein the power supply network visitor location register (5) communicates, via a connecting network (8), with at least one home location register (6) and/or at least one mobile switching center (7).

23. The communications method according to the preceding claim, wherein the connecting network (8) comprises a SS7 signalling system or is the Internet or an intranet.

24. The communications method according to one of the claims 22 to 23, wherein the power supply network visitor location register (5) communicates by means of MAP messages with other network units (6, 6', 7) connected to the connecting network (8).

25. The communications method according to one of the claims 22 to 24, wherein the power supply network visitor location register (5) passes on calls from terminals, by means of a gateway module (53) to respective at least certain mobile devices (1), which calls have been passed on via the connecting network (8) to the power supply network visitor location register (5), and wherein the power supply network visitor location register (5) passes on, by means of this gateway module (53), calls from the at least certain mobile devices (1) via the connecting network (8) to a respective network unit, in

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particular a second power supply network visitor location register, for further transmission to a called terminal.

26. The communications method according to one of the claims 17 to 25, wherein the power supply network visitor location register (5) passes on, to
 5 respective at least certain mobile devices (1), by means of a gateway module (53), calls, which have been received by a mobile switching center (7) from calling terminals (91, 91') and have been passed on to the power supply network visitor location register (5), or respectively passes on to a respective mobile switching center (7), by means of this gateway module (53), calls from
 10 at least certain mobile devices (1) for further transmission to a called terminal (91, 91').

27. The communications method according to one of the claims 17 to 26, wherein the power supply network visitor location register (5) records and bills for services, which have been carried out for a respective at least certain
 15 mobile device (1), by means of a billing module (52).

28. The communications method according to one of the claims 16 to 27, wherein the billing module (52) bills recorded services to a respective at least certain mobile device (1) directly via the low voltage grid (41).

29. The communications method according to one of the claims 16 to 28, wherein the interface module (23) comprises an interface with contacts, a contactless infrared interface, a contactless inductive interface and/or a contactless high frequency radio interface.

30. The communications method according to one of the claims 16 to 29, wherein, by means of charging modules, the connecting modules (2, 2') charge
 25 on the low voltage grid (41) energy storage devices for operation of the mobile devices (1).

31. A connecting module (2, 2') for a communications system according to one of the claims 1 to 15,

which connecting module (2, 2') is set up in such a way that users of
 30 mobile devices (1) are able to connect at least certain of the mobile devices (1)

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to the low voltage grid (41) in each case by means of the connecting module (2, 2'), the connecting module (2, 2') comprising a connecting plug for connection to the low voltage grid (41), by means of which connecting plug the connecting module is connectible to the low voltage grid (41) via outlets (3, 3') of the low voltage grid (41), and the connecting module (2, 2') comprising an interface module (23) for connection with a respective mobile device (1), and

which connecting module (2, 2') comprises a suitable power line communications module (21), by means of which the respective mobile device (1) is able to communicate via the low voltage grid (41) with other units which are connected to the low voltage grid (41) via a power line communications module (51).

32. The connecting module (2, 2') according to the preceding claim, wherein it has stored address data by means of which it is addressable in the low voltage grid (41).

33. The connecting module (2, 2') according to one of the claims 31 to 32, wherein the interface module (23) comprises an interface with contacts, a contactless infrared interface, a contactless inductive interface and/or a contactless high frequency radio interface.

34. The connecting module (2, 2') according to one of the claims 31 to 33, wherein it comprises a charging module by means of which an energy storage device for operation of a mobile device (1) is chargeable on the low voltage grid (41).

35. The connecting module according to one of the claims 31 to 34, wherein the at least certain mobile devices (1) each comprise a mobile radio telephone.

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**Communications System, Communications Method and Suitable Devices
Therefor**

This invention relates to a communications system, a communications method and suitable devices. In particular, this invention relates to a

- 5 communications system according to the preamble of claim 1, a communications method according to the preamble of claim 22 and suitable devices therefor.

- Communications systems in which subscribers can move with their mobile devices into communications networks that are operated by foreign operators, for example (by means of a so-called roaming) are known. The practical achievement of roaming between mobile networks typically requires mutual agreements between the network operators concerned; first, however, the networks concerned must have correspondingly suitable mechanisms and devices in order to make roaming possible also technically. In particular the
- 10 global system for mobile communications (GSM), defined by the European Telecommunications Standards Institute (ETSI, F-06921 Sophia Antipolis, Cedex, France) makes it possible for users of mobile devices to move out of the home mobile network (Home Public Land Mobile Network, HPLMN) into visited mobile networks (Visited Public Land Mobile Network, VPLMN). In a
- 20 GSM mobile network user identifications are linked with call numbers and user data in a home location register (HLR) of the HPLMN. The user data comprise, among other things, location information for a respective user, which is transmitted, for example, from a visitor location register (VLR) of a VPLMN to the said HLR. The VLR recognizes the HLR of a visiting user on the basis of
- 25 his user identification, which is stored in an identification module, removably connected to the mobile device of the user, and is transmitted by the mobile device to the VLR. The VLR transmits to the HLR, either upon request or automatically, a so-called roaming number, which is used by the HLR for further transmission of calls to the respective mobile device in the VPLMN. A
- 30 so-called mobile switching center (MSC) of the GSM network has access to the information stored in the HLR, and serves, among other things, as the interface between the mobile network and the public switched telephone network (PSTN), and directs calls from calling terminals to said mobile devices, or respectively from said mobile devices to called terminals. Although the defined
- 35 network architecture and the services related thereto support the so-called

roaming of mobile devices in VPLMN, this is only possible if a user is located in the radio range covered by the VPLMN. In particular in big countries with areas that are thinly populated, for example, it can very well be that radio coverage is ensured only in the population centers. Moreover there are
 5 buildings and facilities in which no good radio reception is possible.

It is an object of this invention to propose a new communications system, a new communications method as well as new devices suitable therefor, which make it possible for users of mobile devices in particular to communicate with their mobile devices in areas that are not covered by radio and/or are covered
 10 by radio only by a network operator with whom respective users have no subscriber agreement.

This object is attained according to the present invention through the elements of the independent claims. Further preferred embodiments follow moreover from the dependent claims and from the specification.

15 In particular, this object is achieved through the invention in that at least certain mobile devices, for example mobile radio telephones or laptop or palmtop computers with suitable communications modules for mobile networks, for example GSM or UMTS networks, are able to be connected in each case to a power supply network by means of a connecting module, and in that these
 20 connecting modules each comprise a suitable power line communications module, by means of which said at least certain mobile devices are able to communicate via a said power supply network with other units which are connected to a said power supply network via a power line communications module. This has the advantage that these mobile devices are able to
 25 communicate also in areas that do not lie within the radio range of a mobile network and/or which lie in the radio range of a mobile network for which the user of the respective mobile device has no subscriber agreement, but have a power supply network to which these mobile devices can be connected.

Described in the patent publication DE 40 31 092 A1 is a telephone
 30 system in which connection of a telephone apparatus to the public telephone network is made possible with the aid of two modems, via current distribution lines. The advantage of the invention described in DE40 31 092 A1 consists in that too big a distance of a telephone apparatus to a telephone connection jack can be bridged over with the modem connection to a power supply line and with

the modem connection of the telephone connection jack to this power supply line. The invention described in DE 40 31 092 A1 has as a prerequisite a local telephone connection, and is suitable only for a terminal which is supposed to be connected to the public telephone network via this telephone connection.

5 The communications system according to the present invention preferably comprises at least one visitor location register (VLR) which is connected to at least one said power supply network via a said power line communications module, and the mobile devices connected to a power supply network transmit user identifications, stored in identification modules removably
10 connected to the mobile devices, via a power supply network to this power supply network VLR. These mobile devices, or respectively their users, are thereby able to register themselves with the VLR in a similar way as in a conventional mobile network.

15 In an embodiment variant, such a power supply network VLR comprises a table in which address data relating to the said connecting modules are linked with the associated said user identifications and are stored. This has the advantage that a respective connecting module and the mobile device associated therewith, or respectively its user, can be identified and addressed in a power supply network.

20 In a preferred embodiment variant, in addition, roaming numbers are linked in this table with associated user identifications and stored. As in a conventional mobile network, such roaming numbers can be transmitted from the power supply network VLR, either upon request or automatically, to the home location register of a respective user, where they are used for forwarding
25 of calls to the respective mobile device in a power supply network.

 In a conventional mobile network, location information, among other things, is stored in the HLR of a user for this user, which information is transmitted, for example, from a visitor location register (VLR) of a VPLMN to the HLR. The location information, which is transmitted from the power supply
30 network VLR to the HLR of a user, preferably comprises address data relating to the said power supply network VLR, by means of which the location of the respective user is determined and the power supply network VLR can be addressed.

In an embodiment variant, the roaming numbers relating to mobile devices in a power supply network comprise address data relating to a said connecting module. Users in a power supply network, or respectively their mobile devices, can thereby be addressed via the associated connecting modules.

In a preferred embodiment, a power supply network VLR is connected to the HLR of the user via a connecting network and/or to a mobile switching center (MSC) in the home mobile network (Home Public Land Mobile Network, HPLMN) of the user. The connecting network 8 <sic.> is, for example, a local or wide area network (LAN or WAN), a dedicated backbone, an intranet or the Internet, and comprises, for example, a signalling system number 7 (SS7). The power supply network VLR can communicate with other network units connected to the connecting network, for example by means of MAP messages.

The power supply network VLR preferably comprises a gateway module, which is able to pass on calls from terminals to respective mobile devices, hooked up to a power supply network, connected to the power supply network VLR, which calls have been passed on to the said power supply network VLR via the said connecting network, and which gateway module is able to pass on calls from said mobile devices, hooked up to a power supply network, connected to the power supply network VLR, via the said connecting network, to a respective network unit, in particular a second said power supply network visitor location register, for further transmission to a called terminal. Such a gateway module extends the functionality of the power supply network VLR with functions that are typically carried out in a switching center, for example in a mobile switching center (MSC), so that calls can be passed on, for example also between a plurality of power supply network VLRs that are connected to different power supply networks.

The gateway module is preferably able to pass on calls to respective mobile devices connected to the power supply network that are received by a mobile switching center from calling terminals and have been passed on to the power supply network VLR, or respectively pass on to a respective mobile switching center calls from mobile devices connected to the power supply network for further transmission to a called terminal. A power supply network VLR with such a gateway module has the advantage that the communication

between mobile devices connected to a power supply network and terminals in conventional mobile networks and/or fixed networks, for example the public switched telephone network (PSTN), can be carried out for the terminals concerned, or respectively for their users, in a transparent way via the power supply network VLR.

In a preferred embodiment, the power supply network VLR comprises a billing module, which is able to record and bill for services which have been carried out for a respective mobile device connected to the power supply network. This embodiment variant has the advantage that the costs are recorded directly at their point of origin, which simplifies the recording of power supply network-specific costs in particular. In an embodiment variant, the billing module can directly bill recorded services to a respective mobile device connected to the power supply network via the said power supply network, for example in that the costs are debited from a prepaid account, which is located, for example, on an identification module removably connected to the respective mobile device, for instance a chipcard. In another embodiment variant, the billing module is able to generate so-called call detail records (CDR) for the recorded services and transmit them to a clearing point for billing.

In different embodiment variants, the connecting modules comprise an interface with contacts and/or a contactless interface, for example an infrared interface, an inductive interface or a high frequency radio interface, for example a so-called "bluetooth interface" via which they are able to be connected to the said mobile devices.

In an embodiment variant, the connecting modules comprise charging modules, by means of which energy storage devices for operation of the said mobile devices can be charged on the said power supply network.

In an embodiment variant, the said power supply network is a low voltage grid.

One embodiment of the present invention will be described in the following with reference to an example. The example of the embodiment is illustrated by the following single, attached figure:

Figure 1 shows an overview diagram with a power supply network, to which a mobile device is connected via a connecting module, and with a

connecting network, with home location register (HLR) and mobile switching center (MSC), which connecting network is connected to the said power supply network via a power supply network visitor location register.

In Figure 1, reference numeral 1 refers to a mobile device, for example a mobile radio telephone or a laptop or palmtop computer, in each case with suitable communications modules for mobile networks 9, for example GSM networks, UMTS networks or other similar networks. Removably connected to the mobile device 1 is an identification module 12, for example a chipcard of plug-in or full size type, which has a processor and an electronic memory accessible to this processor.

As indicated symbolically by the arrow 20, the mobile device 1 can be connected to a connecting module 2 via an interface. This interface is, for example, an interface with contacts, for instance a plug-in connection with contact elements that are integrated into the housing of the mobile device 1 and of the connecting module 2, or a cable connection in which the mobile device 1 and the connecting module 2 have cable connection jacks and are connected to one another via a suitable cable. In an embodiment variant, this interface is a contactless interface, for example an infrared interface, for instance a high speed infrared interface (HSIR), an inductive interface, for example a home RF (radio frequency) interface or a high frequency radio interface, for instance a so-called "bluetooth interface." A corresponding transmission/reception element 15 is shown symbolically for the mobile device 1 in Figure 1. Besides the hardware elements required for the respective interface, the mobile device 1 and the connecting module 2 comprise in addition the necessary software programs in order to communicate via this interface according to protocols known to one skilled in the art. A respective interface module 23, comprising the mentioned hardware elements and software programs, is schematically indicated for the connecting module 2. The mentioned software programs can be stored in the connecting module 2 in an electronic memory and can be executed in a processor. Such software programs can be stored, or respectively executed, in the mobile device 1 in an internal memory and processor of the mobile device 1, for example; the software program for the communication via the respective interface with the connecting module 2 can also be stored in the memory of the chipcard 12, however, and executed in the processor of this chipcard 12. In a further

embodiment variant, the assignment of the storing and executing of software programs to a chipcard, or respectively to the mobile device can be carried out, for example, in accordance with the Mobile Execution Environment (MEXE) defined by the European Telecommunications Standards Institute (ETSI),

5 customer-relevant data and security functions as well as keys and applets for particular applications being stored, for example, in the memory of the chipcard 12.

The connecting modules 2, 2' also have a connecting plug, either integrated into the housing of the connecting module 2, 2' or connected to the connecting module 2, 2' with a cable, with which they can be connected to the power supply network 4, for example via outlets 3, 3'. As shown schematically for the connecting module 2, the connecting modules 2 each comprise a power line communications module 21 with which a connecting module 2 can communicate via the said power supply network 4 with other units that are

10 connected to the said power supply network 4 via such a power line communications module. A power line communications module 21, 51 comprises hardware and software components known to one skilled in the art for transmitting, or respectively receiving, digital data via power supply networks 4, for instance language data, program data, multimedia data, data

15 telegrams or other data files, for example according to a power line communication (PLC) protocol.

The connecting modules 2, 2' each also comprise a transfer module 22, which accepts data received from the interface module 23 and passes it on to the power line communications module 23 for transmission via the power

20 supply network 4, or respectively accepts data received from the power line communications module 21 and passes it on to the interface module 23 for transmission to the mobile device 1 via the described interface. The transfer module 22 is, for example, a programmed software module, which is executed for instance in the same processor as the software programs for the interface

25 module 23 and/or for the power line communications module 21. Depending upon the protocols used on the interface side and the power supply network side, the transfer module 22 also undertakes, if applicable, necessary protocol conversions.

The reference numeral 5 refers to a visitor location register (VLR) for power supply networks, which register is achieved, for example, in a commercially available communications server, which has an above-mentioned power line communications module 51 and is connected by means thereof to the power supply network 4. Although this is not shown, the power supply network VLR 5 can also be connected to a plurality of power supply networks 4 via the power line communications module 51. In the example shown, the power supply network VLR 5 receives data via the power line communications module 51, which are transmitted, as described above, from a mobile device 1 via a connecting module 2 connected to the power supply network 4 and via the power supply network 4. In the reverse direction, the power supply network VLR 5 transmits by means of the power line communications module 51 data via the power supply network 4 and via the connecting module 2 to the respective mobile device 1 connected to this connecting module 2. For the addressing of the power supply network VLR, a generic address can be used, for example, so that the data transmitted from the mobile devices via a power supply network are transmitted in each case to the power supply network VLR 5 responsible for the respective power supply network 4; a power supply network VLR 5 can be responsible in each case, for instance, for an entire (or for more than one connected) low voltage grid 41, which is separated from the high voltage grid 42 through a symbolically shown transformer. In the reverse direction, the connecting modules hooked up to the power supply network 4 can be addressed individually by the power supply network VLR 5, each connecting module 2 being assigned, for example, its own unambiguous appliance number, or the connecting module 2 is assigned an address by the associated and connected mobile device 1, which address is derived, for example, from the user identification 123 stored in the identification module 12 of the mobile device 1 or from an appliance number of the mobile device 1.

As defined in the GSM standard, for example, a mobile device 1 transmits, for instance when put into operation, the unambiguous user identification 123 stored in the identification module 12, e.g. the international mobile subscriber identity (IMSI), to the visitor location register of a visited network. For the case where the mobile device 1, as described above, is connected to the connecting module 2 via an interface, the user identification is transmitted via this connecting module 2 through the power supply network 4 to

the power supply network VLR 5. In a variant, the emission of the message with the user identification via the antenna 16 of the mobile device 1 can thereby be prevented if the mobile device 1 is connected to the connecting module 2. It can also be provided for that the user of the mobile device 1 is able to set a respective operating mode by means of the operating elements 13 of the mobile device 1.

The user identification transmitted via the power supply network 4 is received by the power line communications module 51 of the power supply network VLR 5, is accepted by a processing module 55 of the power supply network VLR 5 and is stored in a table 54, for instance together with the address of the transmitting connecting module 2. The processing module 55 is e.g. a programmed software module of the power supply network VLR 5.

As with a conventional GSM location update, the power supply network VLR 5 directs the location information to the home location register (HLR) 6 of the user of the mobile device 1, the processing module 55 of the HLR 6 being able, for example, to determine from the user identification an IMSI in particular. The location information comprises, for instance, a network address or a global title of the power supply network VLR 5.

For communication with the HLR 6, 6' of users, with further power supply network VLRs (not shown) and with other network units important for mobile communication, for example a mobile switching center (MSC) 7, the power supply network VLR 5 is connected to a connecting network 8 to which the mentioned network units are also connected. The connecting network is, for instance, a local or wide area network (LAN or WAN), a dedicated backbone, an intranet or the Internet, and comprises, for example, a signalling system number 7 (SS7), all network units connected to the connecting network 8 having available a corresponding communications module 56, 66, 66', 76 with suitable hardware and software elements for connection to, and for communication over, this connecting network 8. The communications modules 56, 66, 66', 76 have, for example, the functionality for exchange of so-called mobile application part (MAP) messages via the connecting network 8. The advantage of exchanging MAP messages, in particular via SS7, consists in that conventional network units such as HLR 6, 6' or MSC 7 possess the corresponding functionality and thus do not have to be adapted. Indicated by

the HLR 6' in Figure 1 should be that the users, who connect their mobile devices 1 to the power supply network 4 with a connecting module 2, can very well come from different home networks (Home Public Land Mobile Network, HPLMN) and be assigned to correspondingly different HLR 6, 6', the
 5 connecting network 8 being able to connect the power supply network VLR 5 to HLRs 6, 6' also across national borders. Although this is not shown, the same also applies for mobile switching stations (MSCs) and further power supply network VLRs, of which in each case several can be connected via the
 10 connecting network 8 with one (or more) power supply network VLRs 5, also across national borders.

Upon request of the HLR 6, or with each location update, the power supply network VLR 5 transmits to the HLR 6 of the user in addition a so-called roaming number which can be used by the HLR 6, for example, to pass on calls to the mobile device 1, connected to the power supply network 4, via the power
 15 supply network visitor location register 5, for instance. The roaming number can be determined e.g. by the above-mentioned processing module 55 and can be registered for the respective user in the mentioned table 54. The roaming number also comprises, for instance, address data relating to the connecting module 2 via which the mobile device 1 is connected to the power supply
 20 network 4.

As shown in Figure 1, the power supply network VLR 5 further comprises a gateway module 53, which is able to pass on calls to respective mobile devices 1, connected to the power supply network 4, that have been received by a MSC 7 from calling terminals 91, 91' or by another power supply network
 25 VLR (not shown) from mobile devices, connected to a power supply network, and have been passed on to the power supply network VLR 5 on the basis of the location information for the respective user stored in the HLR 6. For the reverse direction, the gateway module 53 has the necessary functionality for passing on calls on the basis of the location information stored in the HLR of
 30 the respective called user, from mobile devices 1, connected to the power supply network 4, for further transmission to a respective MSC 7 or a further power supply network VLR (not shown). In the MSC 7, the calls are passed on to the respective called terminal 91 in a fixed network 9, for example the public switched telephone network (PSTN) 9, or respectively to the called mobile
 35 device 91' in a mobile network 91 <sic. 9'>, whereas these calls are further

transmitted in a further power supply network VLR (not shown) to the respective called mobile device connected to a power supply network. The gateway module 53 is, for example, a programmed software module, which also executes, for instance, necessary protocol conversions between the protocols used in the power supply network 4 and in the connecting network 8, and deals with incoming and outgoing calls for the user of a mobile device 1, connected to the power supply network 4, in a transparent way via the power supply network VLR 5. It should be made clear here that this gateway module 53 has in particular a functionality that is not present in conventional VLRs, as are used in mobile networks; this applies in particular to functions which are conventionally carried out in a MSC.

In an embodiment variant, the power supply network VLR 5 further comprises a billing module 52, for example a programmed software module, which is able to bill the costs that arise during communication via the power supply network 4, via the power supply network VLR 5 and via the connecting network 8 to a respective user. The bill can be charged to the connected mobile device 1 for instance by the billing module 52 by means of the power line communications module 51 directly via the power supply network 4 and via the connecting module 2, for example in that the monetary amount to be billed is subtracted from a prepaid monetary amount 122 stored on a chipcard 12 removably connected to the mobile device 1. This direct billing can take place for example in such a way that the billing data are delivered by the billing module 52 to the power line communications module 51 in special short messages, for instance SMS (Short Message Service), USSD (Unstructured Supplementary Services Data) messages or short messages adapted to the power supply network, for transmission to the respective mobile device via the power supply network 4. As was described above, the transmitted short messages with billing data are received in the mobile device 1 and can be accepted by a special program application 121, for instance, stored on the chipcard 12, and, as mentioned, can be debited from the account 122 with the prepaid monetary amount. The completion of this direct billing task between the billing module 52 of the power supply network VLR 5 and the special program application 121 on the chipcard 12 in the mobile device 1 is carried out, for example, according to the SICAP method described in EP 0 689 368.

In an alternative or supplementary variant, the billing module 52 transmits the

billing data, for example via the connecting network 8, to a clearing point (not shown), for instance by means of so-called call detail records (CDRs), which clearing point charges the costs to be billed directly to the respective user, e.g. by means of an invoice sent through the post office or through debiting of a bank account of the respective user, or which clearing point transmits the costs to be billed to the home network operator of the respective user for further processing. One skilled in the art will understand that there are further possibilities for billing the mentioned costs to the user; in particular, the costs can be also recorded in the chipcard 12 and billed there, as has been described, for example, in the unpublished patent application PCT/CH97/00472 in the name of the present applicant, the duration of a call being determined by a time measuring device integrated into the chipcard 12 and the amount to be billed being established on the basis of the determined call duration and at least one tariff table stored in the chipcard 12. The amount to be billed described in this last variant can be debited directly against a prepaid account on the chipcard, for instance, or can be transmitted to a clearing point for further processing by means of CDRs.

It should be mentioned here that it definitely makes sense to carry out the data transmission via the power supply network 4 in a secured way. For this purpose, the power line communications module 21, 51 can be provided, for example, with security functions which operate, for instance, according to a point-to-point (PTP), according to a trusted third party (TTP) method, or according to another encryption method. The security functions can certainly also be carried out on a higher level, for instance in the mobile device 1 and in the power supply network VLR 5.

In an embodiment variant, the already described modules 21, 22, 23 of the connecting module 2 are combined with a charging module (not shown), which comprises hardware elements known to one skilled in the art, in order to charge on the said power supply network 4 energy storage devices for operation of a mobile device.

Although this was not described in detail, it can definitely make sense in certain situations and applications to communicate using mobile devices 1 connected to the power supply network 4 directly over this power supply network 4 with other mobile devices connected to the power supply network 4

and/or also with fixed terminals. The mobile devices can be connected thereby to the same power supply network 4, for instance, or they can be connected to different power supply networks, and via different power supply network VLRs 5 and the connecting network 8 and with the aid of information stored in the HLR 6, 6', for example location information for a respective called user, can communicate with each other, as has already been described. In particular, in areas that do not lie within the radio range of a mobile device, and/or in situations where an operator would like to operate a competing communications network for mobile devices without wanting to build the necessary mobile device infrastructure in less densely populated areas, it can be interesting for an operator to construct a communications system for power supply networks as has been described here. It should be emphasized thereby that the HLRs 6, 6' described do not necessarily need to be part of a mobile network, but instead they can be part of a power supply network communications system, a plurality of HLRs and power supply network VLRs being connected via an above-described connecting network 8, and being able to be operated in a similar way as in a conventional mobile network. The described communications system therefore can certainly be constructed as a power supply network comprehensive communications system via which mobile devices with described connecting modules and/or communications terminals with integrated connecting module functionality can communicate. Via an exchange, for example a MSC 7, such a power supply network comprehensive communications system as described can be connected to the public switched telephone network 9, 9'.

Besides the operation and/or installation of communications systems as have been described in the present invention, it can also be of interest in particular to sell or lease power supply network VLRs 5 to operators of communications networks and/or of power supply networks, or to extend conventional VLRs so that they can be employed as described as power supply network VLRs. Above all the described connecting modules 2 can be sold or leased to interested customers, above all customers staying in the areas or facilities initially mentioned and who wish to make use of their mobile devices there.

Claims

1. A communications system, which comprises a multiplicity of mobile devices (1, 91'), to which an identification module (12) is connected in each case, in which identification modules (12) a user identification (123) of the user of the respective said mobile device (1) is stored in each case, which communications system comprises at least one visitor location register (5), to which visitor location register (5) said user identifications (123) of said users are transmitted by means of a said mobile device (1) and are stored there, and which communications system comprises at least one home location register (6), in which said user identifications are each linked to a call number and to further user data, which user data comprise location information for a respective said user, said location information being transmitted from a said visitor location register (5) to the home location register (6) of a said user, wherein

it comprises connecting modules (2, 2') by means of which at least certain said mobile devices (1) are able to be connected to a power supply network (4),

said connecting modules (2, 2') each comprise a suitable power line communications module (21), by means of which said at least certain mobile devices (1) are able to communicate, via a said power supply network (4), with other units (5) which are connected to a said power supply network (4) via a power line communications module (51).

2. The communications system according to the preceding claim, wherein it comprises at least one visitor location register (5) which is connected to at least one said power supply network (4) via a said power line communications module (51), and

wherein said user identifications (123) are transmitted by said at least certain mobile devices (1) via the said power supply network (4) to this power supply network visitor location register (5).

3. The communications system according to the preceding claim, wherein a said power supply network visitor location register (5) comprises a table (54) in which address data relating to said connecting modules (2, 2') are linked to associated said user identifications and are stored.

4. The communications system according to the preceding claim,
wherein a said power supply network visitor location register (5) transmits to
the said home location register (6, 6') of a said user a roaming number relating
to the said mobile device (1) of this said user, and wherein said roaming
5 numbers are additionally linked in the said table (54) with associated said user
identifications and are stored.

5. The communications system according to the preceding claim,
wherein at least certain of the said roaming numbers comprise address data
relating to a said connecting module (2, 2').

6. The communications system according to one of the preceding claims,
wherein at least certain pieces of the said location information comprise
address data relating to the said power supply network visitor location register
(5).

7. The communications system according to one of the preceding claims,
15 wherein the communications system comprises a connecting network (8) via
which a said power supply network visitor location register (5) is able to
communicate with at least one said home location register (6) and/or at least
one mobile switching center (7).

8. The communications system according to the preceding claim,
20 wherein the said connecting network (8) comprises a SS7 signalling system.

9. The communications system according to claim 7, wherein the said
connecting network (8) is the Internet or an intranet.

10. The communications system according to one of the claims 7 to 9,
wherein the said at least one power supply network visitor location register (5)
25 is able to communicate, by means of MAP messages, with other network units
(6, 6', 7) connected to the said connecting network (8).

11. The communications system according to one of the claims 7 to 10,
wherein the said at least one power supply network visitor location register (5)
comprises a gateway module (53), which gateway module (53) is able to pass
30 on calls from terminals to respective said at least certain mobile devices (1),
which calls have been passed on via the said connecting network (8) to the
said power supply network visitor location register (5), and which gateway
module (53) is able to pass on calls from said at least certain mobile devices

(1) via the said connecting network (8) to a respective network unit, in particular a second said power supply network visitor location register, for further transmission to a called terminal.

12. The communications system according to one of the preceding claims, wherein the said at least one power supply network visitor location register (5) comprises a gateway module (53), which gateway module (53) is able to pass on calls from terminals (91, 91') to respective said at least certain mobile devices (1), which calls have been received from a mobile switching center (7) and have been passed on to the said at least one power supply network visitor location register (5), and which gateway module (53) is able to pass on to a respective said mobile switching center (7) calls from said at least certain mobile devices (1) for further transmission to a called terminal (91, 91').

13. The communications system according to one of the preceding claims, wherein a said at least one power supply network visitor location register (5) comprises a billing module (52) which is able to record and bill for services that have been carried out for a respective said at least certain mobile device (1).

14. The communications system according to the preceding claim, wherein the said billing module (52) is able to bill recorded services to a respective said at least certain mobile device (1) directly via the said power supply network (4).

15. The communications system according to one of the preceding claims, wherein the said connecting modules (2, 2') comprise an interface with contacts via which they are able to be connected to said at least certain mobile devices (1).

16. The communications system according to one of the preceding claims, wherein the said connecting modules (2, 2') comprise a contactless interface via which they are able to be connected to said at least certain mobile devices (1).

17. The communications system according to the preceding claim, wherein at least certain said contactless interfaces are infrared interfaces.

18. The communications system according to one of the claims 16 or 17, wherein at least certain said contactless interfaces are inductive interfaces.

19. The communications system according to one of the claims 16 to 18, wherein at least certain said contactless interfaces are high frequency radio interfaces.

20. The communications system according to one of the preceding claims, wherein the said connecting modules (2,2') comprise charging modules by means of which energy storage devices for operation of the said mobile devices (1) are able to be charged on the said power supply network (4).

21. The communications system according to one of the preceding claims, wherein the said power supply network (4) is a low voltage grid (41).

22. A communications method in which user identifications (123) of users of a multiplicity of mobile devices (1, 91') are each stored in an identification module (12), which identification modules (12) are connected to said mobile devices (1, 91), in which communications method said user identifications (123) of said users are transmitted by means of a said mobile device (1) to a visitor location register (5) and are stored there, and in which communications method said user identifications are each linked to a call number and to further user data and are stored in a home location register (6), said user data comprising location information for a respective said user, and said location information being transmitted from a said visitor location register (5) to the home location register (6) of a said user, wherein

at least certain said mobile devices (1) are connected to a power supply network (4) by means of a connecting module (2),

said connecting modules (2) each comprise a suitable power line communications module (21), by means of which said at least certain mobile devices (1) communicate, via a said power supply network (4), with other units (5) which are connected to a said power supply network (4) via a power line communications module (51).

23. The communications method according to the preceding claim, wherein at least one visitor location register (5) is connected to at least one said power supply network (4) via a said power line communications module (51), and

said user identifications (123) of said at least certain mobile devices (1) are transmitted to this power supply network visitor location register (5) via the said power supply network (4).

24. The communications method according to one of the claims 22 or 23, wherein address data relating to connecting modules (2, 2') are linked with associated said user identifications and are stored in a table (54) of a said power supply network visitor location register (5).

25. The communications method according to the preceding claim, wherein a said power supply network visitor location register (5) transmits to the said home location register (6, 6') of a said user a roaming number relating to the said mobile device (1) of this said user, and wherein said roaming numbers are additionally linked in the said table (54) with associated said user identifications and are stored.

26. The communications method according to the preceding claim, wherein at least certain of the said roaming numbers comprise address data relating to a said connecting module (2, 2').

27. The communications method according to one of the claims 22 to 26, wherein at least certain pieces of the said location information comprise address data relating to a said power supply network visitor location register (5).

28. The communications method according to one of the claims 22 to 27, wherein a said power supply network visitor location register (5) communicates, via a connecting network (8), with at least one said home location register (6) and/or at least one mobile switching center (7).

29. The communications method according to the preceding claim, wherein the said connecting network (8) comprises a SS7 signalling system.

30. The communications method according to claim 28, wherein the said connecting network (8) is the Internet or an Intranet.

31. The communications method according to one of the claims 28 to 30, wherein the said at least one power supply network visitor location register (5) communicates by means of MAP messages with other network units (6, 6', 7) connected to the said connecting network (8).

32. The communications method according to one of the claims 28 to 31, wherein the said at least one power supply network visitor location register (5) passes on calls from terminals, by means of a gateway module (53) to respective said at least certain mobile devices (1), which calls have been
5 passed on via the said connecting network (8) to the said at least one power supply network visitor location register (5), and wherein the said at least one power supply network visitor location register (5) passes on, by means of this gateway module (53), calls from said at least certain mobile devices (1) via the said connecting network (8) to a respective network unit, in particular a second
10 said power supply network visitor location register, for further transmission to a called terminal.

33. The communications method according to one of the claims 22 to 32, wherein the said at least one power supply network visitor location register (5) passes on, to respective said at least certain mobile devices (1), by means of a
15 gateway module (53), calls, which have been received by a mobile switching center (7) from calling terminals (91, 91') and have been passed on to the said at least one power supply network visitor location register (5), or respectively passes on to a respective said mobile switching center (7), by means of this gateway module (53), calls from said at least certain mobile devices (1) for
20 further transmission to a called terminal (91, 91').

34. The communications method according to one of the claims 22 to 33, wherein a said power supply network visitor location register (5) is able to record and bill for services, which have been carried out for a respective said at least certain mobile device (1), by means of a billing module (52).

25 35. The communications method according to one of the claims 22 to 34, wherein the said billing module (52) is able to bill recorded services to a respective said at least certain mobile device (1) directly via the said power supply network (4).

36. The communications method according to one of the claims 22 to 35,
30 wherein the said connecting modules (2, 2') are connected to said at least certain mobile devices (1) via an interface with contacts.

37. The communications method according to one of the claims 22 to 36, wherein the connecting modules (2, 2') are connected to said at least certain mobile devices (1) via a contactless interface.

38. The communications method according to the preceding claim, wherein at least certain said contactless interfaces are infrared interfaces.

39. The communications method according to one of the claims 37 to 38, wherein at least certain said contactless interfaces are inductive interfaces.

5 40. The communications method according to one of the claims 37 to 39, wherein at least certain said contactless interfaces are high frequency radio interfaces.

41. The communications method according to one of the claims 22 to 40, wherein, by means of charging modules, said connecting modules (2, 2')
10 charge on the said power supply network (4) energy storage devices for operation of the said mobile devices (1).

42. The communications method according to one of the claims 22 to 41, wherein the said power supply network (4) is a low voltage grid (41).

43. A connecting module (2, 2') for a communications system according
15 to claims 1 to 21, which connecting module (2, 2') is able to be connected to at least certain mobile devices (1) via an interface, wherein

it is able to be connected to a power supply network (4), and

it comprises a suitable power line communications module (21), by means of which said at least certain mobile devices (1) are able to
20 communicate, via the said power supply network (4), with other units which are connected to a said power supply network (4) via a power line communications module (51).

44. The connecting module (2, 2') according to the preceding claim, wherein it has stored address data by means of which it is able to be
25 addressed in the said power supply network (4).

45. The connecting module (2, 2') according to one of the claims 43 or 44, wherein it comprises an interface with contacts via which it is able to be connected to said at least certain mobile devices (1).

46. The connecting module (2, 2') according to one of the claims 43 to
30 45, wherein it comprises a contactless interface via which it is able to be connected to said at least certain mobile devices (1).

47. The connecting module (2, 2') according to the preceding claim, wherein the said contactless interface is an infrared interface.

48. The connecting module (2, 2') according to one of the claims 46 or 47, wherein the said contactless interface is an inductive interface.

49. The connecting module (2, 2') according to one of the claims 46 to 48, wherein the said contactless interface is a high frequency radio interface.

50. The connecting module (2, 2') according to one of the claims 43 to 49, wherein it comprises a charging module by means of which an energy storage device for operation of a said mobile device (1) can be charged on the said power supply network (4).

51. The connecting module (2, 2') according to one of the claims 43 to 50, wherein the said power supply network (4) is a low voltage grid (41).

52. The connecting module according to one of the claims 43 to 50, wherein said at least certain mobile devices (1) each comprise a mobile radio telephone.

53. A visitor location register (5) for a communications system according to the claims 1 to 21, to which visitor location register (5) user identifications of users are transmitted by means of a mobile device (1) and are stored there, and which visitor location register (5) passes on location information for a said user to his home location register (6), wherein

the visitor location register (5) comprises a power line communications module (51), by means of which it is able to be connected to at least one power supply network (4), and

said user identifications from at least certain mobile devices (1), which are connected to a said power supply network via connecting modules (2, 2'), are received by the visitor location register (5) via a said power supply network (4).

54. The visitor location register (5) according to the preceding claim, wherein it comprises a table (54) in which address data relating to said connecting modules (2, 2') are linked with associated said user identifications and are stored.

55. The visitor location register (5) according to the preceding claim, wherein it (5) transmits to the home location register (6, 6') of a said user a roaming number relating to the said mobile device (1) of this said user, and wherein said roaming numbers are additionally linked in the said table (54) with associated said user identifications and are stored.

56. The visitor location register (5) according to the preceding claim, wherein at least certain of the said roaming numbers comprise address data relating to a said connecting module (2, 2').

57. The visitor location register (5) according to one of the claims 53 to 56, wherein it is able to communicate, via a connecting network (8), with at least one said home location register (6) and/or at least one mobile switching center (7).

58. The visitor location register (5) according to the preceding claim, wherein the said connecting network (8) comprises a SS7 signalling system.

59. The visitor location register (5) according to claim 57, wherein the said connecting network (8) is the Internet or an intranet.

60. The visitor location register (5) according to one of the claims 57 to 59, wherein the visitor location register (5) is able to communicate by means of MAP messages with other network units (6, 6', 7) which are connected to the said connecting network (8).

61. The visitor location register (5) according to one of the claims 57 to 60, wherein it comprises a gateway module (53), which gateway module (53) is able to receive calls from terminals, which calls have been passed on to the visitor location register (5) via the said connecting network (8), and is able to pass them on to respective said at least certain mobile devices (1), and which gateway module (53) is able to pass on calls from said at least certain mobile devices (1) via the said connecting network (8) to a respective network unit, in particular a second said visitor location register, for further transmission to a called terminal.

62. The visitor location register (5) according to one of the claims 53 to 61, wherein it comprises a gateway module (53), which is able to pass on calls to respective said at least certain mobile devices (1) that have been received by a mobile switching center (7) from calling terminals (91, 91') and have been

passed on to the visitor location register (5), or respectively is able to pass on to a respective mobile switching center (7) calls from said at least certain mobile devices (1) for further transmission to a called terminal (91, 91').

- 5 63. The visitor location register (5) according to one of the claims 53 to 62, wherein it comprises a billing module (52) which is able to record and bill for services that have been carried out for a respective said at least certain mobile device (1).

- 10 64. The visitor location register (5) according to the preceding claim, wherein the said billing module (52) is able to bill recorded services to a respective said at least certain mobile device (1) directly via the said power supply network (4).

65. The visitor location register (5) according to one of the claims 53 to 64, wherein the said power supply network (4) is a low voltage grid (41).

Abstract

Communications system in which at least certain mobile devices (1) are each able to be connected to a power supply network (4) via a connecting
5 module (2), which connecting modules (2) comprise a power line communications module (21) by means of which said mobile devices (1) are able to communicate, via the said power supply network (4), with a visitor location register (5), which register is connected to the said power supply
10 network (4) via a power line communications module, user identifications (123) in particular, which are stored in an identification module (12), removably connected in each case to a mobile device (1), being transmitted by the mobile devices (1) via the said power supply network (4) to this power supply network
15 visitor location register (5). Calls from terminals (91, 91') to respective mobile devices (1) connected to the power supply network are passed on by a mobile switching center (7) via the power supply network visitor location register (5) to the mobile devices (1), respectively transmitted in reverse direction to called terminals (91, 91') via the power supply network visitor location register (5) and the mobile switching center (7)

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25

(sole Figure)

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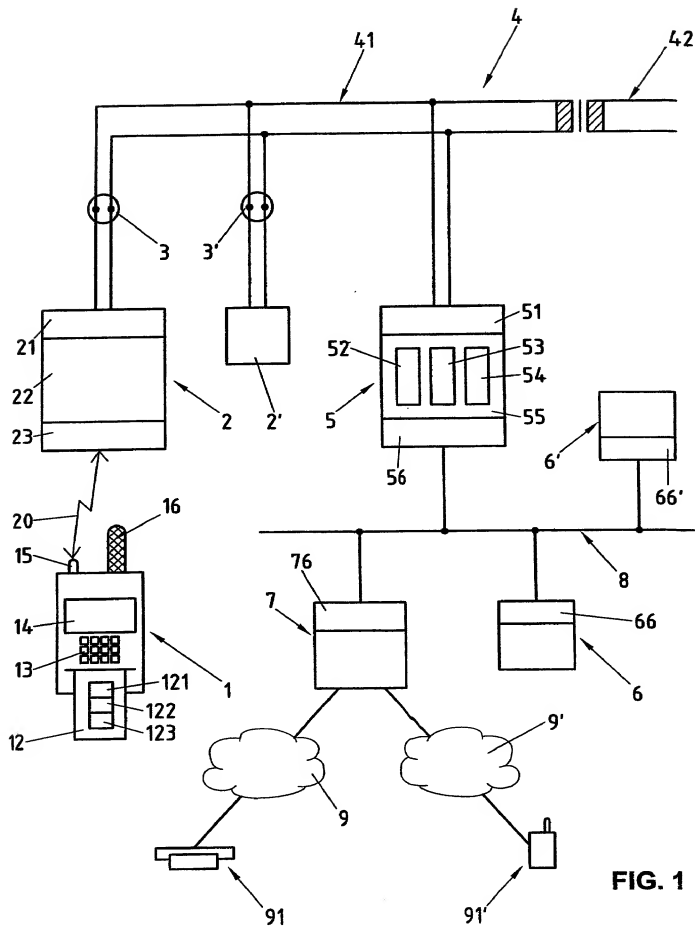


FIG. 1

Declaration and Power of Attorney For Patent Application

Erklärung Für Patentanmeldungen Mit Vollmacht

German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

deren Beschreibung

☒ Zutreffendes ankreuzen)

☒ hier beigefügt ist.

☒ am _____ unter der

☒ Anmeldungsnummer _____

eingereicht wurde und am _____
abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Communications System, Communications Method
and Suitable Devices Therefor

the specification of which

(check one)

☒ is attached hereto.

☒ was filed on 24 December 1998 as

Application Serial No. PCT/CH 98/00553

and was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

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German Language Declaration

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäß Title 35, US-Code, § 119 (a)-(d), bzw. § 365(b) aller unten aufgeführten Auslandsanmeldungen für Patente oder Erfindurkunden, oder § 365(a) aller PCT internationalen Anmeldungen, welche wenigstens ein Land ausser den Vereinigten Staaten von Amerika benennen, und habe nachstehend durch ankreuzen sämtliche Auslandsanmeldungen für Patente bzw. Erfindurkunden oder PCT internationale Anmeldungen angegeben, deren Anmeldetag dem der Anmeldung, für welche Priorität beansprucht wird, vorangeht.

Prior Foreign Applications
(Frühere ausländische Anmeldungen)

(Number) (Country)
(Number) (Land)

(Number) (Country)
(Number) (Land)

Ich beanspruche hiermit Prioritätsvorteile unter Title 35, US-Code, § 119(e) aller US-Hilfsanmeldungen wie unten aufgezählt.

(Application No.) (Filing Date)
(Aktenzeichen) (Anmeldetag)

(Application No.) (Filing Date)
(Aktenzeichen) (Anmeldetag)

Ich beanspruche hiermit die mir unter Title 35, US-Code, § 120 zustehenden Vorteile aller unten aufgeführten US-Patentanmeldungen bzw. § 365(c) aller PCT internationalen Anmeldungen, welche die Vereinigten Staaten von Amerika benennen, und erkenne, insofern der Gegenstand eines jeden früheren Anspruchs dieser Patentanmeldung nicht in einer US-Patentanmeldung, bzw. PCT internationalen Anmeldung in einer gemäß dem ersten Absatz von Title 35, US-Code, § 112 vorgeschriebenen Art und Weise offenbart wurde, meine Pflicht zur Offenbarung jeglicher Informationen an, die zur Prüfung der Patentfähigkeit in Einklang mit Title 37, Code of Federal Regulations, § 1.56 von Belang sind und die im Zeitraum zwischen dem Anmeldetag der früheren Patentanmeldung und dem nationalen oder im Rahmen des Vertrags über die Zusammenarbeit auf dem Gebiet des Patentwesens (PCT) gültigen internationalen Anmeldetags bekannt geworden sind.

(Application No.) (Filing Date)
(Aktenzeichen) (Anmeldetag)

(Application No.) (Filing Date)
(Aktenzeichen) (Anmeldetag)

Ich erkläre hiermit, daß alle in der vorliegenden Erklärung von mir gemachten Angaben nach bestem Wissen und Gewissen der Wahrheit entsprechen, und ferner daß ich diese eidesstattliche Erklärung in Kenntnis dessen ablege, daß wissentlich und vorsätzlich falsche Angaben oder dergleichen gemäß § 1001, Title 18 des US-Code strafbar sind und mit Geldstrafe und/oder Gefängnis bestraft werden können und daß derartige wissentlich und vorsätzlich falsche Angaben die Rechtswirksamkeit der vorliegenden Patentanmeldung oder eines aufgrund deren erteilten Patentes gefährden können.

I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Not Claimed
Priorität nicht beansprucht

(Day/Month/Year Filed)
(Tag/Monat/Jahr der Anmeldung)

(Day/Month/Year Filed)
(Tag/Monat/Jahr der Anmeldung)

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

Norman F. Oblon, Registration Number 24,618; Marvin J. Spivak, Registration Number 24,913; C. Irvin McClelland, Registration Number 21,124; Gregory J. Maier, Registration Number 25,589; Arthur I. Neustadt, Registration Number 24,854; Richard D. Kelly, Registration Number 27,757; James D. Hamilton, Registration Number 28,421; Eckhard H. Kuesters, Registration Number 28,870; Robert T. Pous, Registration Number 29,089; Charles L. Gholz, Registration Number 28,395; Vincent J. Sunderdick, Registration Number 29,004; William E. Beaumont, Registration Number 30,996; Steven B. Kelber, Registration Number 30,073; Robert F. Gnuse, Registration Number 27,295; Jean-Paul Lavalleye, Registration Number 31,451; Stephen G. Baxter, Registration Number 32,884; Martin M. Zolnick, Registration Number 35,745; Robert W. Hahl, Registration Number 33,889; Richard L. Treanor, Registration Number 36,379; Steven P. Weihrouch, Registration Number 32,829; John T. Gookasian, Registration Number 26,142; Marc R. Labgoid, Registration Number 34,651; William J. Healey, Registration Number 36,160; Richard L. Chinn, Registration Number 34,305; Steven E. Lipman, Registration Number 30,011; Carl E. Schlier, Registration Number 34,426; James J. Kulbaski, Registration Number 34,848; Catherine B. Richardson, Registration Number 39,007; Richard A. Nefield, Registration Number 35,299; and J. Derek Mason, Registration Number 35,270; with full powers of substitution and revocation.

Telefongespräche bitte richten an:
(Name und Telefonnummer)

Direct Telephone Calls to: (name and telephone number)

(703) 413-3000

Postanschrift:

Send Correspondence to:

OBLOM, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.

FOURTH FLOOR
1755 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VIRGINIA 22202 U.S.A.

Voller Name des einzigen oder ursprünglichen Erfinders:

Full name of sole or first inventor

Rudolf RITTER

Unterschrift des Erfinders

Datum

28.05.01

Inventor's signature

Date

Wohnsitz

3052 Zollikofen (Switzerland)

Residence

Staatsangehörigkeit

Switzerland

Citizenship

Postanschrift

Rosswiedweg 8

Post Office Address

3052 Zollikofen (Switzerland)

Voller Name des zweiten Miterfinders (falls zutreffend)

Full name of second joint inventor, if any

Unterschrift des Erfinders

Datum

Second Inventor's signature

Date

Wohnsitz

Residence

Staatsangehörigkeit

Citizenship

Postanschrift

Post Office Address

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben.)

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